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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,405	12/11/2003	Haochuan Jiang	GEMS8081.200	1404
27061	7590	02/08/2006	EXAMINER	
ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (GEMS)			SONG, HOON K	
14135 NORTH CEDARBURG ROAD				
MEQUON, WI 53097			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 02/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/707,405

Applicant(s)

JIANG ET AL.

Examiner

Hoon Song

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,13-15,17-22 and 24-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,13-15,17-22 and 24-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

In view of the applicant's argument, the restriction requirement has been withdrawn.

Response to Amendment

The affidavit filed on 8/17/2005 under 37 CFR 1.131 is sufficient to overcome the Mliner et al. reference.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-4, 13-14, 19, 22, 24-29, 31-34, 36 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Iwanczyk et al. (US 5773829).

Regarding claim 1, Iwanczyk teaches a CT detector comprising:

a scintillator array having a plurality of scintillators (36A) and

a reflector (60) interstitially disposed between at least two adjacent scintillators (36A), the reflector including a light absorption element (64) disposed between a pair of reflective elements (60) and

a reflective layer coated to a face of the scintillator array (figure 2).

Regarding claim 3, Iwanczyk teaches the light absorption element is configured to reduce optical cross-talk between the at least two adjacent scintillators (column 8 line 55).

Regarding claim 4, Iwanczyk teaches the light absorption element is configured to substantially eliminate optical cross-talk between the at least two adjacent scintillators (column 8 line 55).

Regarding claim 13, Iwanczyk teaches the detector incorporated into a CT imaging system (figure 1).

Regarding claim 14, Iwanczyk teaches the CT imaging system is configured to acquire radiographic data of a medical patient (figure 1).

Regarding claim 19, Iwanczyk the pair of reflective elements include TiO_2 .

Regarding claim 22, Iwanczyk teaches a method of CT detector manufacturing comprising the steps of:

providing a scintillator array (36a) of a plurality of scintillators, wherein the step of providing a scintillator array includes the step of forming a substrate of scintillation material;

disposing a reflective layer (60) between adjacent scintillators (36a, 36b) and
disposing a composite layer (64) in the reflective layer (60).

Regarding claim 24, Iwanczyk teaches pixelating the substrate (figure 2).

Regarding claim 25, Iwanczyk teaches the step of pixelating includes at least one of chemically and mechanically forming gaps (by placing the scintillator blocks with gaps as shown in figure 2) in the substrate to define a plurality of scintillators (column 4 line 20).

Regarding claim 26, Iwanczyk teaches mechanically forking gaps includes dicing the substrate (column 4 line 20).

Regarding claim 27, Iwanczyk teaches the step of depositing reflective material into at least the gaps (figure 4 and 5).

Regarding claim 28, Iwanczyk teaches the step of depositing includes the step of casting (column 5 line 22).

Regarding claim 29, Iwanczyk teaches the step of disposing a composite layer in the reflective layer includes the step of creating channels in the reflective material (the successive coating on the scintillator block will create reflective layer channel, figure 5).

Regarding claim 31, Iwanczyk teaches the step of depositing composite material (74) into the channels (figure 3 and 5).

Regarding claim 32, Iwanczyk teaches the composite material includes a metal and a polymer (column 5 line 25+).

Regarding claim 33, Iwanczyk teaches the step of depositing composite material into the channels includes casting (column 5 line 22).

Regarding claim 34 and 36, Iwanczyk teaches a CT detector comprising:

A scintillator array having a plurality of scintillators (36A, 36B); and

A reflector (60) interstitially disposed between at least two adjacent scintillators, the reflector including a light absorption element (64) disposed between a pair of reflective elements, wherein the light absorption element is configured to absorb x-rays, reduce x-ray punch through.

Regarding claim 41, Iwanczyk teaches a CT detector comprising:

A scintillator array having a plurality of scintillators (36a); and

A reflector (60) interstitially disposed between at least two adjacent scintillators, the reflector including a light absorption element disposed between a pair of reflective elements, wherein the pair of reflective elements includes TiO_2 (column 8 line 47).

Claims 1, 3, 4, 13-14, 19, 22, 24-25, 34-38 and 40-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsunota et al. (US 6495845B1).

Regarding claim 1, Tsunota teaches a CT detector comprising:

a scintillator array having a plurality of scintillators (2) and

a reflector (4) interstitially disposed between at least two adjacent scintillators, the reflector including a light absorption element (3) disposed between a pair of reflective elements and

a reflective layer coated to a face of the scintillator array (figure 1).

Regarding claim 3, Tsunota teaches the light absorption element is configured to reduce optical cross-talk between the at least two adjacent scintillators.

Regarding claim 4, Tsunota teaches the light absorption element is configured to substantially eliminate optical cross-talk between the at least two adjacent scintillators.

Regarding claim 13, Tsunota teaches the detector incorporated into a CT imaging system.

Regarding claim 14, Tsunota teaches the CT imaging system is configured to acquire radiographic data of a medical patient.

Regarding claim 19, Tsunota the pair of reflective elements include TiO_2 .

Regarding claim 22, Tsunota teaches a method of CT detector manufacturing comprising the steps of:

providing a scintillator array (2) of a plurality of scintillators, wherein the step of providing a scintillator array includes the step of forming a substrate of scintillation material;

disposing a reflective layer (4) between adjacent scintillators and
disposing a composite layer (3) in the reflective layer.

Regarding claim 24, Tsunota teaches pixelating the substrate (figure 1).

Regarding claim 25, Tsunota teaches the step of pixelating includes at least one of chemically and mechanically forming gaps in the substrate to define a plurality of scintillators (figure 1).

Regarding claims 34, 36 and 37, Tsunota teaches a CT detector comprising:

A scintillator array having a plurality of scintillators (2); and

A reflector (4) interstitially disposed between at least two adjacent scintillators, the reflector including a light absorption element (3) disposed between a pair of reflective elements, wherein the light absorption element is configured to absorb x-rays,

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reduce x-ray punch through wherein, the light absorption element includes a high atomic number metal composite (column 8 line 40+).

Regarding claim 38, Tsunota teaches the metal composite includes a cured metal powder and low viscosity polymer combination.

Regarding claim 40, Tsunota teaches the metal composite includes at least one of tungsten, tantalum and a metal powder with density greater than 16g/cm^3 .

Regarding claim 41, Tsunota teaches a CT detector comprising:

A scintillator array having a plurality of scintillators (2); and

A reflector (4) interstitially disposed between at least two adjacent scintillators, the reflector including a light absorption element disposed between a pair of reflective elements, wherein the pair of reflective elements includes TiO_2 .

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsunota.

Regarding claim 6, Tsunota teaches the claimed invention except for the light absorption element is configured to absorb approximately 50% of the x-ray. It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure to absorb 50% of x-ray, since it has been held that where the general

conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. Accordingly, one having ordinary skill in the art would be motivated to adapt the claimed absorption since it would further improve the cross-talk between the scintillator pixels.

Claims 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh et al. (US 6061419) in view of Tsunota et al. (US 6495845B1).

Regarding claim 15, Hsieh teaches a CT system comprising:

a rotatable gantry having a bore centrally disposed therein (figure 1);

a table movable fore and aft through the bore and configured to position a subject for CT data acquisition (figure 1);

a high frequency electromagnetic energy projection source positioned within the rotatable gantry and configured to project high frequency electromagnetic energy toward the subject (figure 1); and

a detector array disposed within the rotatable gantry and frequency electromagnetic energy projected by the projection source and impinged by the subject, the detector array including (figure 1):

a scintillator array configured to illuminate upon reception of radiographic energy.

however Hsieh fails to teach the each reflector assembly includes a composite layer sandwiched between at least a pair of reflective layers; and

wherein the composite layer includes a high-z metal and a low-viscosity polymer.

Tsunota teaches a CT detector having the each reflector assembly includes a composite layer sandwiched between at least a pair of reflective layers; and wherein the composite layer includes a high-z metal and a low-viscosity polymer.

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the CT detector of Hsieh with the scintillation layer with reflector and composite layer as taught by Tsunota, since the device of Tsunota would reduce the cross-talk between the scintillators.

Regarding claim 17, Tsunota teaches the high Z-metal includes one of tungsten.

Regarding claim 18, Tsunota teaches the low-viscosity polymer has a non-translucent color.

Regarding claim 19, Tsunota teaches the at least a pair of reflective layers includes TiO₂.

Regarding claim 20, Tsunota fails to teach the claimed thickness of reflective layer d the composite layer.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the claimed thickness, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. Accordingly, the thickness would provide effective reduction of cross-talk.

Regarding claim 21, Tsunota teaches the reflector assembly is cast between adjacent scintillators.

Regarding claims 26-33, Tsunota fails to teach the claimed method of forming the scintillator.

The claimed method of forming is known in substrate forming art such as semiconductor.

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the method of forming scintillator of Tsunota with known forming method, since the method would accurately provide the scintillation pixel according to the detector pixel.

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwanczyk.

Regarding claim 35, Iwanczyk teaches the light absorption element is further configured to absorb the x-ray photons across a gap between the at least two adjacent scintillators.

However Iwanczyk fails to teach that the absorption element is absorbing 50% of photons.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to absorb 50% of photons, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. Accordingly, one would be motivated to configure the absorption element to absorb 50 % since it would effectively reduce the cross-talk between the scintillator blocks.

Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsunota.

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Regarding claim 39, Tsunota fails to teaches the polymer includes polyurethane.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to adapt polyurethane, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. Accordingly, one would be motivated to adapt the polyurethane because of its availability of manufacturing.

Response to Arguments

Applicant's arguments with respect to claims 1, 3-4, 13-15, 17-22, 24-44 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is (571) 272-2494. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272 - 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HKS

2/3/06
HKS



DAVID V. BRUCE
PRIMARY EXAMINER